In the claims:

1. (Currently Amended) A soft hybrid-electric vehicle power supply circuit for a soft hybrid-electric vehicle comprising:

a load sensor generating a load signal;

a high-voltage bus supplying a high voltage for a high-voltage load ~~other than an engine starter~~;

a low-voltage bus electrically coupled to and supplying a low-voltage to a low-voltage load; and

a converter circuit electrically coupled to said high-voltage bus, said low-voltage bus, and said high voltage load, said converter circuit maintaining a predetermined minimum voltage level on said high-voltage load by switching between said high-voltage bus and said low-voltage bus in response to said load signal to supply power to said high-voltage load from only one of said high-voltage bus and said low-voltage bus.

2. (Original) A circuit as in claim 1 further comprising an integrated starter generator supplying power to said high-voltage bus or an engine.

3. (Original) A circuit as in claim 2 further comprising:

an integrated starter generator control circuit electrically coupled to said integrated starter generator and said high-voltage bus, said integrated starter generator control circuit signaling said integrated starter generator in response to said load signal.

4. (Original) A circuit as in claim 3 wherein said integrated starter generator control circuit comprises:

an inverter processing electrical power between said high-voltage bus and said integrated starter generator; and

an integrated starter generator controller electrically coupled to said inverter and determining when to process said electrical power.

5. (Original) A circuit as in claim 1 wherein said converter circuit comprises:

a bi-directional switch; and

a bi-directional converter electrically coupled to said bi-directional switch and controlling said bi-directional switch, said bi-directional converter controlling direction of voltage conversion from either said high-voltage bus to said low-voltage bus or from said low-voltage bus to said high-voltage bus to maintain said predetermined minimum voltage level on said high-voltage load.

6. (Original) A circuit as in claim 1 further comprising a high-voltage energy storage device electrically coupled to and supplying power to said high-voltage bus.

7. (Original) A circuit as in claim 1 further comprising a low-voltage energy storage device electrically coupled to and supplying power to said low-voltage bus.

8. (Original) A circuit as in claim 1 wherein said converter circuit maintains said predetermined minimum voltage level during soft hybrid-electric vehicle engine high-loading periods.

9. (Original) A circuit as in claim 1 wherein said predetermined minimum voltage level is approximately 30 volts.

10. (Previously Presented) A soft hybrid-electric vehicle power supply system for a soft hybrid-electric vehicle comprising:

a engine propelling the soft hybrid electric vehicle;

an engine controller determining the status of said engine and generating a load signal; and

a soft hybrid-electric vehicle power supply circuit comprising;

a high-voltage bus supplying a high voltage for a high-voltage load;

a low-voltage bus electrically coupled to and supplying a low-voltage to a low-voltage load; and

a converter circuit electrically coupled to said high-voltage bus, said low-voltage bus, and said high voltage load, said converter circuit maintaining a predetermined minimum voltage level on said high-voltage load by switching between said high-voltage bus and said low-voltage bus in response to said load signal;

said converter circuit generating a converter circuit status signal upon switching voltage supply for said high-voltage load;

said engine controller signaling said engine to draw power from said high-voltage bus in response to said converter circuit status signal.

11. (Original) A system as in claim 10 further comprising an integrated starter generator supplying power to said high-voltage bus or said engine.

12. (Original) A system as in claim 11 further comprising an integrated starter generator control circuit electrically coupled to said integrated starter generator and said high-voltage bus, said integrated starter generator control circuit adjusting performance of said integrated starter generator.

13. (Original) A system as in claim 12 wherein said integrated starter generator control circuit comprises:

an inverter processing electrical power between said high-voltage bus and said integrated starter generator; and

an integrated starter generator controller electrically coupled to said inverter and determining when to process said electrical power.

14. (Original) A system as in claim 10 wherein said converter circuit comprises:

a bi-directional switch; and

a bi-directional converter electrically coupled to said bi-directional switch and controlling said bi-directional switch, said bi-directional converter controlling direction of voltage conversion from either said high-voltage bus to said low-voltage bus or from said low-voltage bus to said high-voltage bus to maintain said predetermined minimum voltage level on said high-voltage load.

15. (Original) A system as in claim 10 further comprising a high-voltage energy storage device electrically coupled to and supplying power to said high-voltage bus.

16. (Original) A system as in claim 10 further comprising a low-voltage energy storage device electrically coupled to and supplying power to said low-voltage bus.

17. (Original) A system as in claim 10 wherein said converter circuit maintains said predetermined minimum voltage level during soft hybrid-electric vehicle engine high-loading periods.

18. (Original) A system as in claim 10 wherein said predetermined minimum voltage level is approximately 30 volts.

19. (Previously Presented) A method of maintaining a predetermined minimum voltage level on a high-voltage load for a soft hybrid-electric vehicle comprising:

generating a load signal;

performing a high-voltage mode when said load signal is greater than a predetermined load and generating a first direction signal and performing a low-voltage mode when said load signal is less than or equal to a predetermined load and generating a second direction signal;

switching a bi-directional switch to an open state in response to said first direction signal and to a closed state in response to said second direction signal; and

performing an up-conversion in response to said first direction signal and a down-conversion in response to said second direction signal to maintain a predetermined minimum voltage level on the high-voltage load.

20. (Original) A method as in claim 19 wherein performing an up-conversion and a down-conversion comprises:

determining time to perform a voltage conversion;

determining a power rating for said voltage conversion; and

determining a duration of time to perform said voltage conversion.

21. (Previously Presented) A method as in claim 20 wherein switching said bi-directional switch and performing said voltage conversion comprises:

decoupling a high-voltage load from said high-voltage bus and coupling said high-voltage load to a low-voltage bus during soft hybrid-electric vehicle engine high-loading periods; and

coupling said high-voltage load to said high-voltage bus and decoupling said high-voltage load from said low-voltage bus during normal-loading periods.

22. (Original) A method as in claim 19 further comprising initiating a high-loading mode on a converting circuit before executing said high-loading mode on an integrated starter generator.